REMARKS

Formal Matters

Claims 43-59 are pending in the application.

Claims 43, 48, 49 and 51 are amended. The amendments to the claims were made solely in the interest of expediting prosecution, and are not to be construed as an acquiescence to any objection or rejection of any claim. No new matter is added by these amendments.

Claims 3-11, 14-20 and 22-42 are withdrawn from consideration without prejudice to the possibility of filing one or more applications directed to the subject matter recited therein.

Claims 43-59 are rejected. No claims were allowed.

Objection to the specification

The specification is objected to as containing embedded hyperlinks.

To address this rejection, the Applicants have amended the specification to remove the embedded hyperlinks.

In view of these amendments, withdrawal of this objection is respectfully requested.

Claim objections

Claim 51 is objected to because it is missing the word "of" after the word "level" in the second line of the claim. Additionally, claim 51 is objected to because it is missing a colon (":") after the word "steps".

Without wishing to acquiesce to the correctness of these objections, the Applicants have amended claim 51 to recite "level of" in the second line of the claim, and "steps:" in the preamble.

The Applicants respectfully submit that these objections have been adequately addressed and the rejection may be withdrawn.

Rejection under 35 U.S.C. §112, first paragraph (enablement)

Claims 43-59 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention. The Applicants respectfully traverse this rejection.

As the Applicants understand this rejection, the rejection appears state that the claims are not enabled to their full scope because a) data obtained from a single colon cancer patient is unreasonably extrapolated to encompass other patients; b) data from colon cancer cells is unreasonably extrapolated to encompass cancer cells other than colon cancer cells; and c) there is an inadequate description of how expression of the subject gene product could be used to measure tumor burden.

With respect to the first aspect of this rejection, the Examiner's attention is drawn to the second table shown on page 84 (paragraph 243) of the instant application. This table demonstrates that the gene corresponding to SEQ ID NO:3 (i.e. cluster 9083) is overexpressed in 3 of 4 colon cancer patients tested.

As such, contrary to the Examiner's observations, the sample size of the patient population used is 4, not 1. The Applicants respectfully submit that this data, since it is derived from 4 patients, can be reasonable extrapolated to larger patient populations.

The Applicants respectfully submit that the foregoing discussion adequately addresses this aspect of the rejection.

With respect to the second aspect of this rejection, the Examiner's attention is drawn to Fig. 1, which shows overexpression of SEQ ID NO:3 (i.e. cluster 9083) in various cell lines, including cell lines from lung (IMR90), glioblastoma (I373MG), prostate (GRDP2, PC3, WOCA and LNCAP), colon (HCT15, HCT116, SW480, LOVO, and others), ovary (OVCAR3, SKOV3), sarcoma (HT1080), and breast (e.g., MDA-MB-468, MDA-MB-435, and MDA-MD-231). The Applicants respectfully submit that this data, since it represents several different cancer types from at least 7 tissues, can reasonably extrapolated to all cancers.

The Applicants respectfully the foregoing discussion adequately addresses this aspect of the rejection.

Finally, with respect to the question of whether there is an inadequate description of how expression of the subject gene product could be used to measure tumor burden, the Applicants respectfully submit that tumor burden may be straightforwardly determined by merely measuring the level of a gene product corresponding to SEQ ID NO:3. The greater the expression level of the gene product corresponding to SEQ ID NO:3, the greater the tumor burden. Conversely, the lower the expression level of the gene product corresponding to SEQ ID NO:3, the lower the tumor burden. Since the Applicants have provided several methods of measuring the expression level of the gene product

corresponding to SEQ ID NO:3, the Applicants respectfully submit that a skilled person would be able to measure the tumor burden of a cancer patient using a probe for a gene product corresponding to SEQ ID NO:3 without undue experimentation.

The Applicants respectfully submit that the foregoing discussion adequately addresses this aspect of the rejection.

In view of the foregoing discussion, withdrawal of this rejection is respectfully requested.

Rejection under 35 U.S.C. §112, first paragraph (written description)

Claims 51-55 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonable convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Applicants respectfully traverse this rejection.

This claim appears to be based on the assertion that "with the exception of SEQ ID NO:3, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides and/or proteins".

The claims are directed to a method involving a polynucleotide probe comprising at least 50 contiguous nucleotides of SEQ ID NO:3 or complement thereof.

The Applicants respectfully submit that a specific description of the sequence of any "flanking sequences" that could surround the claim-recited polynucleotides is not necessary to practice the claim, not necessary to show that the inventers were in possession of the invention, and not necessary to determine which methods are encompassed by the claim. The flanking sequences, however long they may be, merely represent a functionless milieu in which the subject probe sequence may exist. Since a skilled researcher can readily identify the recited probes (they have 50 contiguous nucleotides of SEQ ID NO:3), and readily use them in the claimed method, the Applicants respectfully that a skilled person would recognize that the Applicants were in possession of the Invention. The Applicants respectfully submit that a skilled persons' knowledge of vectors, primers, linkers, and DNA in general would allow that person to instantly envision a great number of DNA sequences that contain SEQ ID NO:3, meeting the requirements for written description set forth in the Office Action.

The Office Action cites *Vas-Cath*, *Fiers v Revel*, *Amgen v Chugai*, and *Lilly* in support of the rejection. With the exception of *Vas-Cath*, the caselaw cited in the Office Action does not seem to be relevant to the instant case: the patents applications at issue in *Fiers v Revel*, *Amgen v Chugai*, and *Lilly*

all attempted to claim specific polynucleotide compositions without describing any particular sequence for that polynucleotide. The instant case is different because the exact sequence of a probe is set forth in the claims: the sequence of SEQ ID NO:3. The Applicants cannot see the relevancy of this caselaw to these rejected claims because all that is needed to practice the claims is 50 contiguous nucleotides of SEQ ID NO:3, as set forth in the sequence listing, as opposed to the sequence of nucleic acid that is not specifically described. With respect to *Vas-Cath*, which sets forth a "possession" test for written description, the Applicants respectfully submit that by providing the sequence of SEQ ID NO:3, they have shown that they were in possession of the invention, and, as such, have met the standard set forth in *Vas-Cath*.

In view of the foregoing discussion, the Applicants respectfully submit that the claimed subject matter meets the written description requirement of 35 U.S.C. §112, first paragraph, and, accordingly, withdrawal of this rejection is respectfully requested.

Rejection under 35 U.S.C. §112, second paragraph (indefiniteness)

Claims 43-50 are rejected as indefinite for the recitation of "said gene", when there appears to be no antecedent basis for a gene.

The phrase "said gene" in claim 43 has been amended to recite "said gene product".

The Applicants respectfully submit that the phrase "said gene product" has antecedent product in claim 43 and this rejection may be withdrawn.

Claim 43-50 are further rejected as indefinite because the intention of the claim is assertedly not clear.

Without wishing to acquiesce to the correctness of this rejection, the body of claim 43 has been amended to recite the phrase "wherein results of said comparing step indicate that the test sample contains a cancerous cell"

The Applicants respectfully submit that the intention of the claim is now clear: it is a method for detecting a cancerous cell.

Withdrawal of this rejection is respectfully requested.

Claims 48 and 49 are rejected as indefinite because the phrases "uses polymerase chain reaction" and "uses hybridization" are assertedly not actual process steps.

Without wishing to acquiesce to this rejection, claims 48 and 49 are each amended to recite the phrase "comprises a step of performing".

The Applicants respectfully submit that "polymerase chain reaction" and "hybridization" are recited as actual process steps and this rejection may be withdrawn.

Claims 56-59 are rejected as indefinite for reciting "tumor burden", which the Office Action asserts is a unclear phrase that would not be understood. The Applicants respectfully traverse this rejection.

The Applicants respectfully assert that "tumor burden" is a phrase that is frequently used and well understood by artisans of cancer research. In support of this assertion, the Applicants provide herewith the first page of the results of a search of the NCBI Pubmed database for the phrase "tumor burden" (Exhibit A), which shows that this phrase is found in approximately 2000 publications. Further, the Applicants provide herewith an entry in NCBI's Cancer.gov dictionary (Exhibit B), which states that tumor burden refers to the number of cancer cells, the size of a tumor, or the amount of cancer in the body.

Since "tumor burden" is a dictionary defined term that well used by skilled persons, the Applicants respectfully submit that a skilled person would recognize the subject matter of these claims. Accordingly, there is no need for a clarification of what is meant by this phrase.

The Applicants respectfully submit that the foregoing discussion adequately addresses this objection. Withdrawal of this objection is respectfully requested.

Rejection under 35 U.S.C. §102

Claims 51-55 are rejected under 35 U.S.C. §102(a) as being anticipated by Quackenbush et al (Genbank accession AW965860), dated June 15, 2000. This rejection is respectfully traversed.

The claims are rejected on the basis that the "comparing" step in the claims is a mental step and given no patentable weight. By ignoring this step, the claims are rejected as anticipated by Quackenbush.

The Applicants respectfully submit that there is no basis, either in the case law, the MPEP, or any examination guideline, that indicates that steps that are mental steps should be given no patentable weight.

In fact, on the contrary, the case law (see, e.g., *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F. 3d 1368, 47 USPQ2d 1596, Fed. Cir. 1998), the MPEP (see e.g., MPEP § 2106(i)), and the USPTO Examination Guidelines for Computer-Related Inventions, (published February 28, 1996, Federal Register (61 Fed. Reg. 7478)) indicate that a claim that recites only mental steps, e.g., a claim directed to a software procedure that provides a useful outcome, is patentable.

Since the "comparing" step, even though it could be a "mental" step, modifies the way in which the claimed method is performed, it should be read as a limitation, just like any other step. Accordingly, since Quackenbush fails to recite a "comparing" step, or, for that matter, fails to recite a comparing step that indicates that a cell is a cancerous cell, it cannot anticipate the subject claims.

In view of the foregoing discussion, withdrawal of this rejection is respectfully requested.

If the Examiner intends to maintain this rejection, the Examiner is respectfully requested to set forth, on the record, the reasons, using caselaw and/or guidelines for examination (e.g., the MPEP) why a mental step (e.g., a step that could be performed by computer software) can be ignored if it alters the way in which a claimed method is performed.

CONCLUSION

Applicants respectfully submit that all of the claims in the present application are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please contact either attorney listed below at the number provided.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815, order number 2300-1663.

Respectfully submitted,
BOZICEVIC, FIELD & FRANCIS LLP

Date: July 21, 2003

By: James S Keddie

James S. Keddie
Registration No. 48,920

BOZICEVIC, FIELD & FRANCIS LLP
200 Middlefield Road, Suite 200
Menlo Park, CA 94025
Telephone: (650) 327-3400
Facsimile: (650) 327-3231
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